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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,445	07/22/2003	Geoffrey Huang	50325-0785	7960
29989 7590 08/07/2007 HICKMAN PALERMO TRUONG & BECKER, LLP 2055 GATEWAY PLACE SUITE 550 SAN JOSE, CA 95110			EXAMINER LEMMMA, SAMSON B	
			ART UNIT 2132	PAPER NUMBER
			MAIL DATE 08/07/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/625,445

Applicant(s)

HUANG ET AL.

Examiner

Samson B. Lemma

Art Unit

2132

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-16, 18-35, 37-50, 52-65 and 67-71 is/are rejected.
- 7) ☒ Claim(s) 10, 17, 36, 51 and 66 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Art Unit: 2132

DETAILED ACTION

1. This office action is in reply to an amendment filed on May 14, 2007.

Claims 1-71 are pending/examined.

Response to Arguments

2. Applicant's remark/arguments filed on May 14, 2007 regarding **claims 1-71** have been fully considered but are moot in view of new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 4-9, 15-16, 19-23, 26-27, 30-35, 41-42, 45-50, 56-57, 60-65 and 71** are rejected under 35 U.S.C. 103(a) as being unpatentable over a publication, title, "A probabilistically Correct Leader Election Protocol for Large Groups" (Published on 2000) **by Indranil Gupta** (hereinafter referred as **Gupta**) (Submitted with IDS) in view of Basani et al (hereinafter referred as **Basani**) (U.S. Patent No. 6,993,587 filed on April 7, 2000)

5. **As per claims 1, 4-9, 15-16, 19-23, 26-27, 30-35, 41-42, 45-50, 56-57, 60-65 and 71, Gupta discloses a method performed by a first computer node for selecting a leader node to provide service to a plurality of other nodes in a multicast group, wherein each of the nodes communicates using multicast, broadcast or anycast messages, the method**

Art Unit: 2132

comprising the computer-implemented steps of [See, Figure 3, "The Complete Election Protocol"]:

- **Issuing a first, election call message;** [figure 3, "The Complete Election Protocol", see number 1] *(On receiving "Init election" message I specifying Sequence, RoundNum, select K from RoundNum using strategy)*
- **Receiving candidacy announcement messages from one or more leader candidate nodes in a specified time period;** [figure 3, "The Complete Election Protocol", see number 2] *(Find the set of members $\{M_j\}_i$ in my view such that $H(M_jAI) \times N_i < K$ find best preferred leader in my view and send this using ucast messages to members in $\{M_j\}_i$ I do until Time Out 2/specified time period receive similar preferred leader messages for this Sequence, RoundNum from other members M_k include M_k in $\{M_j\}_i$ and M_i 's view) compare current best leader choice with M_k 's preference using choice function if M_k 's preference better, update current best leader choice and send ucast messages to all members in $\{M_j\}_i$ specifying this)*
- **selecting a victor from among all leader candidate nodes from which candidacy announcement messages are received;** [figure 3, "the complete election protocol", see number 2] *(Compare current best leader choice with M_k 's preference using choice function if M_k 's preference better, **update current best leader choice**, meets the limitation of selecting a victor from among all leader candidate nodes from which candidacy announcement message are received, and send ucast messages to all members in $\{M_j\}_i$ specifying this)*
- **Receiving one or more victor announcement messages from one or more leader victor nodes for a second specified time period;** [figure 3, "The Complete Election Protocol", see number 2 and 3] *(else inform M_k using a ucast of M_i 's current best choice wait Time Out 3/second specified time period, to receive everyone's final leader choice. 3. if received none or more than one leader as final choice, choose one of the final choice messages F if $H(M_iAF$*

Art Unit: 2132

$) \times N_i < K$, multicast an initiating message I specifying Sequence, RoundNum+ 1 wait for Time Out 3, increment RoundNum and jump to step 1. if no re-initiating mcast received within another Time Out 3, declare received choice as elected leader and include it in M_i 's)

- **Resolving zero or more collisions among the victor announcement messages to result in selecting the leader node.** [figure 3, "The Complete Election Protocol, see number 3, see last line"] (else increment RoundNum and jump to step 1)

Gupta does not explicitly teach "receiving candidacy announcement messages" and the limitation recited in claim 16 as, "the election call message, candidacy announcement messages, and victor announcement messages, are multicast, broadcast or anycast messages."

However, in the same field of endeavor, Basani discloses that if any server fails to observe the LA messages for a configurable period, then such a server initiates a new election. In its simplest form, the first server to correctly notice the leader is dead and to claim leadership, via an issued "**Leader claim**" message, becomes the new leader. If no other server sends a **Leader claim message (LC) to the group within a preset time**, then the vote is over, and the new leader **sends its own LA messages to the group/ victor announcement messages**. However, each GL candidate may have different priorities, i.e., one may be administratively deemed preferable over another.[See column 14, lines 26-39.

Furthermore on the **abstract Basani discloses the following,**

"The members of a group of servers in a multicast network elect a group leader whenever a new group leader is required, as when the prior group leader become unavailable, as detected by absence of a periodic heartbeat message published by the leader. The election is carried out by a system of voting by each candidate whereby each candidate has a priority calculated from its configuration, and the server with the highest priority is configured to claim the leadership faster than the other candidates.

As part of the claim, **each candidate multicasts its priority/ candidacy**

Art Unit: 2132

announcement messages. Each candidate that receives a multicast claim for leadership from another candidate compares its own priority against the claimant and only votes for itself if its own priority is higher. After a preconfigured period of hearing no other claimants with higher priority, the candidate with the highest priority becomes the new leader.”

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the feature providing/announcing candidacy/victor announcement messages as per teachings of **Basani** into the method as taught by **Gupta in order to create a fault tolerant system.** [See Basani, Column 14, lines 26-40]

6. **Claims 2-3, 11-14, 18, 24-25, 28-29, 37-40, 43-44, 52-55, 58-59 and 67-70** are rejected under 35 U.S.C. 103(a) as being unpatentable over a publication, title, “A probabilistically Correct Leader Election Protocol for Large Groups” (Published on 2000) **by Indranil Gupta** (hereinafter referred as **Gupta**) (Submitted with IDS) in view of Basani et al (hereinafter referred as **Basani**) (U.S. Patent No. 6,993,587 filed on April 7, 2000) and further in view of the **Publication, title “CAPSL and MuCAPSL”** (Published on 4/2002) **by Jonathan K. Millen** (hereinafter referred as **Millen**)

7. **As per independent claims 2-3, 11-14, 18, 24-25, 28-29, 37-40, 43-44, 52-55, 58-59 and 67-70** Gupta discloses a method performed by a first computer node for selecting a leader node to provide service to a plurality of other nodes in a multicast group, wherein each of the nodes communicates using multicast, broadcast or anycast messages, the method comprising the computer-implemented steps of [See, Figure 3, “The Complete Election Protocol”]:

- **Issuing a first, election call message; [figure 3, “The Complete Election Protocol”, see number 1](On receiving “Init election” message I specifying**

Art Unit: 2132

Sequence, RoundNum, select K from RoundNum using strategy)

- **Receiving candidacy announcement messages from one or more leader candidate nodes in a specified time period; [figure 3, "The Complete Election Protocol", see number 2]** *(Find the set of members $\{M_j\}_i$ in my view such that $H(M_j A_i) \times N_i < K$ find best preferred leader in my view and send this using ucast messages to members in $\{M_j\}_i$ I do until Time Out 2/specified time period receive similar preferred leader messages for this Sequence, RoundNum from other members M_k include M_k in $\{M_j\}_i$ and M_i 's view) compare current best leader choice with M_k 's preference using choice function if M_k 's preference better, update current best leader choice and send ucast messages to all members in $\{M_j\}_i$ specifying this)*
- **selecting a victor from among all leader candidate nodes from which candidacy announcement messages are received; [figure 3, "the complete election protocol", see number 2]** *(Compare current best leader choice with M_k 's preference using choice function if M_k 's preference better, **update current best leader choice**, meets the limitation of selecting a victor from among all leader candidate nodes from which candidacy announcement message are received, and send ucast messages to all members in $\{M_j\}_i$ specifying this)*
- **Receiving one or more victor announcement messages from one or more leader victor nodes for a second specified time period; [figure 3, "The Complete Election Protocol", see number 2 and 3]** *(else inform M_k using a ucast of M_i 's current best choice wait Time Out 3/second specified time period, to receive everyone's final leader choice. 3. if received none or more than one leader as final choice, choose one of the final choice messages F if $H(M_i A_i F) \times N_i < K$, multicast an initiating message I_1 specifying Sequence, RoundNum+ 1 wait for Time Out 3, increment RoundNum and jump to step 1. if no re-initiating mcast received within another Time Out 3, declare received choice as elected leader and include it in M_i 's)*

Art Unit: 2132

- **Resolving zero or more collisions among the victor announcement messages to result in selecting the leader node. [figure 3, "The Complete Election Protocol, see number 3, see last line"]** *(else increment RoundNum and jump to step 1)*

Gupta does not explicitly teach "receiving candidacy announcement messages" or the limitation recited in claim 16 as, "the election call message, candidacy announcement messages, and victor announcement messages, are multicast, broadcast or anycast messages."

However, in the same field of endeavor, Basani discloses that if any server fails to observe the LA messages for a configurable period, then such a server initiates a new election. In its simplest form, the first server to correctly notice the leader is dead and to claim leadership, via an issued "**Leader claim**" message, becomes the new leader. If no other server **sends a Leader claim message (LC) to the group within a preset time**, then the vote is over, **and the new leader sends its own LA messages to the group/ victor announcement messages.** However, each GL candidate may have different priorities, i.e., one may be administratively deemed preferable over another. [See column 14, lines 26-39.

Furthermore on the **abstract Basani discloses the following,**

"The members of a group of servers in a multicast network elect a group leader whenever a new group leader is required, as when the prior group leader become unavailable, as detected by absence of a periodic heartbeat message published by the leader. The election is carried out by a system of voting by each candidate whereby each candidate has a priority calculated from its configuration, and the server with the highest priority is configured to claim the leadership faster than the other candidates. As part of the claim, **each candidate multicasts its priority/ candidacy announcement messages.** Each candidate that receives a multicast claim for leadership from another candidate compares its own priority against the claimant and

Art Unit: 2132

only votes for itself if its own priority is higher. After a preconfigured period of hearing no other claimants with higher priority, the candidate with the highest priority becomes the new leader."

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the feature providing/announcing candidacy/victor announcement messages as per teachings of **Basani** into the method as taught by **Gupta in order to create a fault tolerant system**. [See Basani, Column 14, lines 26-40]

The combination of Gupta and Basani does not explicitly teach that the leader node is a key server that provides keys for use in encrypting multicast group messages and the leader node is, a GDOI key server that provides keys to nodes according to Group Domain of Interpretation.

However, in the same field of endeavor, Millen discloses *that the role-based task specifications of multicast protocols with the help of the key distribution protocol. The leader of the group initiates the key distribution protocol whenever a member has been added to or deleted from the group, meets the limitation of the leader node is a key server that provides keys. We distinguish two main roles in the key distribution: the role of the leader M1 and the role of other members of the group Mi. Figure 3 roughly illustrates the message flow of the agent in role M1. M1 broadcasts the new group key to the entire group (illustrated in Fig. 3 by the square around the role Mi. A unicast message to a member in role Mi would be depicted by leaving the square out. The member uses a sequence field (denoted by < ::: >) that includes N copies of the new group key, each **encrypted with one of the shared keys**, and this meets the limitation of keys for use in encrypting multicast group messages. The other group members acknowledge the receipt of the group key by each sending a message that contains their position and a nonce encrypted with the group key. The leader collects all responses. [page 22, column 2, paragraphs 2-3]*

Furthermore, Millen on page 21, 1st column, last paragraph, under the title, "4. Secure muticast", discloses the following, which meets the limitation of GDOI key server that provides keys to nodes according to Group Domain of Interpretation. "Protocols for secure group management are essential in applications that are concerned with confidential authenti-cated communication among coalition members, authenti-cated group decisions, or the secure administration of group membership and access control. A variety of new proto-cols and frameworks have been designed to create multicast groups on a network and support secure group communi-cation (e.g., GDOI [3], GSAKMP [17]."

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the **technical features of Secure multicast** as per teachings of **Millen** into the method as taught by the combination of **Gupta and Basani** in order **to provide secure communication**. [See Millen, Abstract]

Allowable Subject Matter

8. **Claims 10, 17, 36, 51 and 66** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samson B Lemma whose telephone number is 571-272-3806. The examiner can normally be reached on Monday-Friday (8:00 am---4: 30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BARRON JR GILBERTO can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 703-873-8300.

Art Unit: 2132

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAMSON LEMMA

S.L.

07/28/2007


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